

Trend Study 9-5-00

Study site name: Island Park.

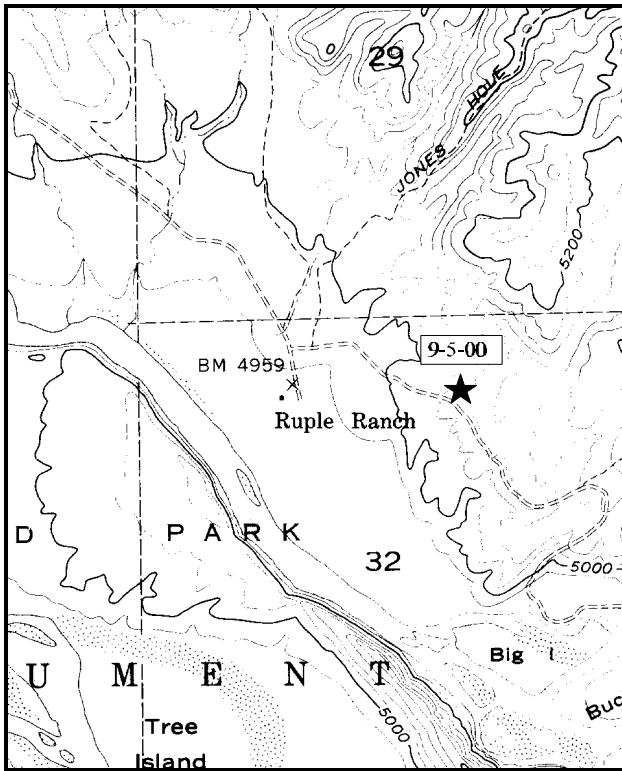
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 12°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (9 & 88ft), line 2 (26ft), line 3 (48ft), line 4 (73ft).

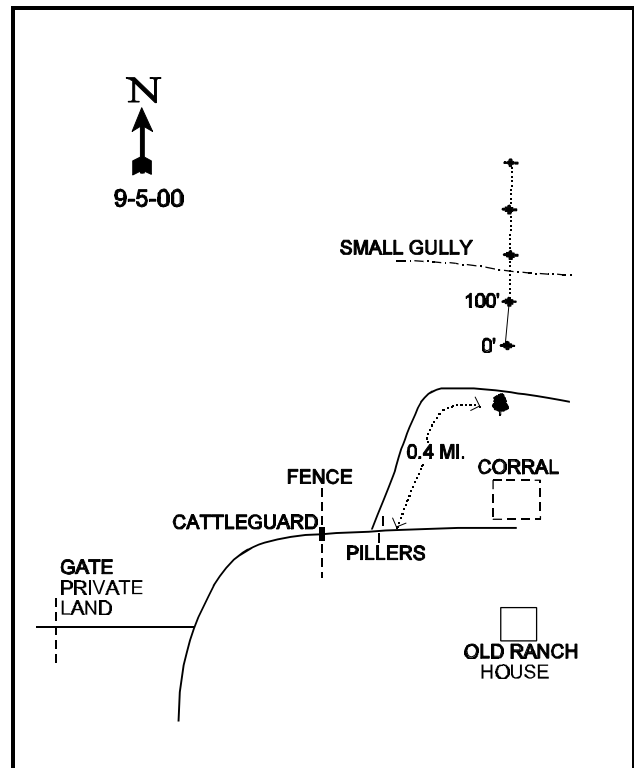
LOCATION DESCRIPTION

From the Diamond Mountain Road, take the Island Park turnoff to the right. Proceed east for 2.1 miles to a fork. Stay to the left and go 17.7 miles. Just past the Jones Hole trailhead and before Ruple Ranch, there is a turnoff to the left. The road may be closed. Go left and proceed up the ridge for 0.4 miles to a juniper next to the road on the right. From the juniper, the 0-foot baseline stake is 20 paces away at a bearing of 28°M.



Map Name: Island Park

Township 3S, Range 25E, Section 32



Diagrammatic Sketch

UTM 4487260 N, 658118 E

DISCUSSION

Trend Study No. 9-5 (11-6)

The Island Park study is located on a sagebrush-grass slope one-half mile above the Green River in Dinosaur National Monument. This site is on deer winter range at an elevation of approximately 5,000 feet and a slope of about 25%. Aspect is south, southwest. Deer and rabbit pellets had high quadrat frequencies in 1995, while elk were low. Quadrat frequency decreased for deer and rabbit pellets in 2000, but increased for elk. A pellet group transect read along the baseline in 2000 estimates 47 deer days use/acre (116 ddu/ha) and 57 elk days use/acre (141 edu/ha). Livestock grazing is no longer permitted as this site is found within the national monument.

Soils are a sandy loam with little surface rock. Estimated effective rooting depth is nearly 13 inches and average soil temperature is relatively high at over 73°F. Soil temperatures this high often indicate the potential for annual weed invasion, primarily from winter annuals such as cheatgrass. Soil movement is noticeable, which is currently ('00) described as being moderate. Interspaces between shrubs are generally devoid of vegetation except for the small annual grasses, sixweeks fescue and cheatgrass. Cryptogamic crusts have slowly increased since 1982 with no grazing. They provide added protection to the soil. With drought in 2000, bare ground increased from 31% to nearly 45%.

In 1982, the key browse species was identified as Wyoming big sagebrush. At that time it was in fair to poor condition and moderately hedged. Thirty percent of the stand displayed poor vigor and percent decadency was relatively high for a Wyoming big sagebrush site at 44%. The 1988 survey found a more decadent stand of sagebrush (29% mature, 51% decadent) with moderate to heavy hedging, poor growth, and low seed production. In 1995, percent decadency declined to 39%, with 71% (920 plants/acre) of these decadent plants being classified as dying. Also, nearly 80% of the population displayed moderate or heavy hedging. Those classified with poor vigor increased to 29% of the population. The number of dead plants/acre in 1995, indicated that 1 of almost every 3 plants (1,520 plants/acre) were dead. In 2000, the condition of sagebrush continued to decline. Percent decadency has drastically increased to 82%, half of the population is classified with poor vigor, while use remains at a moderate to high level. Sixty-one percent of the decadent plants were classified as dying in 2000, representing 1,390 plants/acre that could be lost from the population if conditions persist. Young recruitment is low (80 plants/acre) and not adequate to replace individuals lost to a die-off. Extended drought, inter and intraspecific competition appear to be the most negatively influencing factors to this sagebrush stand. Leader growth on sagebrush is currently ('00) poor, averaging 1-2 inches. It appears that the sagebrush on this site has some characteristics of both basin big sagebrush (*Artemisia tridentata tridentata*) and Wyoming big sagebrush (*A. tridentata wyomingensis*), indicating hybridization between the two subspecies.

Another sign of possible declining range condition, first noted in 1982, was the abundance of broom snakeweed which appeared to have an expanding population. In 1995, snakeweed was estimated at 3,580 plants/acre with high recruitment (36%) and mostly good vigor. In 2000, snakeweed has increased exponentially to an estimated 30,120 plants/acre. Snakeweed often declines with drought, but with this large of a population, the drought conditions in 2000 appear to have not yet negatively impacted this species. The population appears stable with 92% of the population being mature. Other shrubs encountered on the site include: slenderbush eriogonum, pricklypear cactus and small numbers of prickly phlox.

The understory is dominated by needle-and-thread grass which made up 68% of the herbaceous cover in both 1995 and 2000. It currently ('00) provides 28% of the total vegetation cover. Thickspike wheatgrass is the only other perennial grass that is somewhat abundant. It was sampled in 19 quadrats (19% quadrat frequency) in 2000. Two annual grasses, sixweeks fescue and cheatgrass, are present on the site. Sixweeks fescue was more abundant of the two in 1995, but due to drought in 2000, was much less abundant compared to 1995 estimates.

Cheatgrass increased in nested frequency in 2000. It is presently found in about one-third of the quadrats. Forbs are depleted and dominated by annuals and provide little useful forage. All forbs, both annual and perennial species, drastically decreased in sum of nested frequency in 2000. Although, even at its best, the forbs together only provided just over 1% cover. This site is now best described as a decadent Wyoming big sagebrush community with a depleted understory.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable to declining. The estimates for ground cover show approximately 51% bare ground and less than 3% basal vegetative cover. There is active sheet and gully erosion underway and considerable quantities of soil and litter have piled up against small obstructions. Vegetative trend appears to be declining. The best evidence would appear to be an aggressive and expanding population of snakeweed and the fair to poor condition of the key browse species, Wyoming big sagebrush. In addition, understory composition is less than desirable and produces little quality forage. Furthermore, grass and forb density is inadequate to prevent or seriously impede soil movement.

1988 TREND ASSESSMENT

Percent litter cover has declined resulting in an increase in the amount of exposed bare soil, from 50% to 60%. Consequently, there is evidence of some soil loss and sedimentation. Trend for soil is slightly down. Trend for the key browse, Wyoming big sagebrush is also slightly down. Even though total population increased, the number of mature plants declined from 2,000 plants/acre to 1,666. The increase in population came primarily from the increase in decadent plants (1,666 to 2,866) which account for 51% of the population. Heavy use was also higher with 34% of the sagebrush displaying heavy hedging. Another negative factor is the abundance of broom snakeweed which increased since 1982. The herbaceous trend is up especially for grasses. Quadrat frequency of grasses doubled since 1982. Composition is dominated by needle-and-thread grass. Forbs are depleted and provide little useful forage.

TREND ASSESSMENT

soil - slightly down and poor condition (2)

browse - slightly down due to heavy use and increased decadence (2)

herbaceous understory - up for grasses, but forbs are scarce (5)

1995 TREND ASSESSMENT

Trend for soil is slightly up due to a large increase in cryptogamic crusts (5% to 11%) and an obvious increase in vegetation cover noted in the data and photos. Aerial cover instead of basal cover was estimated in 1995. Percent bare ground decreased from nearly 60% to 31%. Vegetation and litter also have high nested frequencies values indicating well dispersed cover. The spring of 1995 was unusually wet and may be partly responsible for the dramatic change in some of these ground cover values. Browse trend continues to decline due to continued moderate to heavy use, high decadence, poor vigor, declining population density, and continuing drought. The herbaceous trend is slightly up with increases in sum of nested frequency of perennial grasses and forbs.

TREND ASSESSMENT

soil - slightly up, still poor condition (4)

browse - continues down (1)

herbaceous understory - slightly up, but still poor for forbs (4)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground increased and erosion is considered moderate at this time. The abundance of herbaceous vegetation, especially perennial species, decreased in 2000 due to continuing drought. Herbaceous vegetation is key to holding soils in place. Trend for browse is down. Wyoming big sagebrush increased in decadency from 39% to 82%. Half of the sagebrush population is classified with poor vigor. Recruitment is currently low (80 plants/acre) and not adequate to replace the decadent individuals classified as dying (1,380 plants/acre). Over the past 18 years, young plants have averaged 11% of the population, while dead plants account for 31% of the population. Thus in the long term, the dead within the population are not being replaced. Furthermore, broom snakeweed exploded in density from 3,580 plants/acre to an estimated 30,120 plants/acre. Trend for the herbaceous understory is down. Sum of nested frequency of perennial grasses and forbs declined by nearly half due to continuing drought.

TREND ASSESSMENT

soil - slightly down (2)

browse - down (1)

herbaceous understory - down (1)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	62	38	43	-	26	16	19	.10	1.42
G	Agropyron spicatum	-	4	4	-	-	1	2	.03	.18
G	Bromus tectorum (a)	-	_a 40	_b 97	-	-	22	35	.16	1.48
G	Hilaria jamesii	25	43	21	17	11	17	8	.50	.24
G	Oryzopsis hymenoides	12	6	11	5	6	3	4	.39	.62
G	Poa fendleriana	_a -	_b 5	_a -	-	-	3	-	.06	-
G	Poa secunda	2	4	7	2	1	2	3	.01	.01
G	Sitanion hystrix	_b 31	_b 36	_a 4	8	17	18	1	.24	.15
G	Stipa comata	_a 213	_b 285	_a 217	44	88	96	84	12.38	9.53
G	Vulpia octoflora (a)	-	_b 324	_a 5	-	-	98	3	2.97	.06
Total for Annual Grasses		0	364	102	0	0	120	38	3.13	1.55
Total for Perennial Grasses		345	421	307	76	149	156	121	13.73	12.16
Total for Grasses		345	785	409	76	149	276	159	16.86	13.71
F	Allium spp.	_a 9	_b 130	_a 1	9	6	64	1	.42	.00
F	Astragalus convallarius	8	18	5	3	6	8	2	.12	.01
F	Astragalus purshii	_a -	_b 3	_a -	-	-	3	-	.01	-
F	Castilleja chromosa	-	3	4	-	-	1	2	.03	.03
F	Calochortus nuttallii	_a -	_{ab} 3	_b 6	1	-	2	3	.01	.01
F	Chenopodium leptophyllum (a)	-	1	-	-	-	1	-	.00	-
F	Descurainia pinnata (a)	_a 1	_b 57	_a -	-	1	25	-	.12	-
F	Draba spp. (a)	-	_b 35	_a -	-	-	12	-	.06	-
F	Erigeron spp.	-	3	5	-	-	1	2	.00	.01

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Euphorbia robusta	-	3	-	-	-	1	-	.03	-
F	Ipomopsis congesta	_a -	_b 8	_a -	-	-	4	-	.02	-
F	Lepidium spp. (a)	-	_b 24	_a -	-	-	13	-	.09	-
F	Lesquerella spp.	1	1	-	-	1	1	-	.00	-
F	Lygodesmia spp.	-	3	-	-	-	2	-	.01	-
F	Machaeranthera grindelioides	3	-	-	-	1	-	-	-	-
F	Phlox longifolia	_b 72	_a 23	_a 22	-	35	11	10	.05	.15
F	Plantago patagonica (a)	-	_b 16	_a -	-	-	6	-	.05	-
F	Polygonum douglasii (a)	-	3	4	-	-	1	2	.00	.01
F	Sisymbrium altissimum (a)	-	3	2	-	-	1	1	.15	.03
F	Sphaeralcea coccinea	_a 3	_b 18	_a 7	1	1	10	3	.13	.01
F	Taraxacum officinale	-	3	1	-	-	1	1	.00	.00
F	Unknown forb-perennial	_b 7	_a -	_a -	-	3	-	-	-	-
Total for Annual Forbs		1	139	6	0	1	59	3	0.49	0.04
Total for Perennial Forbs		103	219	51	14	53	109	24	0.86	0.24
Total for Forbs		104	358	57	14	54	168	27	1.35	0.29

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --

Herd unit 09 , Study no: 5

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	79	78	7.76	5.69
B	Eriogonum microthecum	30	15	.19	.16
B	Gutierrezia sarothrae	76	100	.98	12.44
B	Leptodactylon pungens	2	2	.03	.15
B	Opuntia spp.	20	16	.07	.36
Total for Browse		207	211	9.06	18.83

BASIC COVER --

Herd unit 09 , Study no: 5

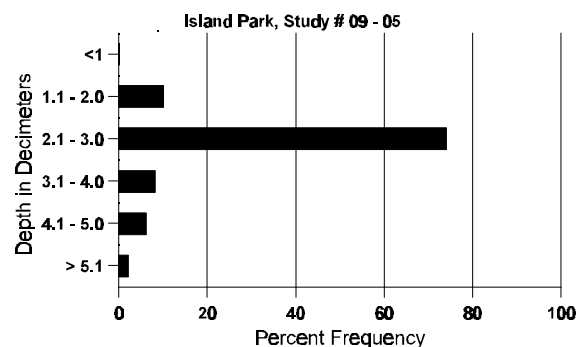
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	369	323	2.75	4.75	31.06	35.34
Rock	-	-	0	0	0	0
Pavement	2	3	0	0	.01	.15
Litter	397	370	45.50	31.00	32.54	35.04
Cryptogams	245	208	1.00	4.50	10.82	12.38
Bare Ground	320	337	50.75	59.75	31.40	44.68

SOIL ANALYSIS DATA --

Herd Unit 09, Study # 5, Study Name: Island Park

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.94	73.4 (14.33)	7.3	57.4	26.7	15.9	0.6	4.0	112.0	0.6

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 5

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
			'00	'00
Rabbit	45	10	679	N/A
Elk	6	25	740	57 (141)
Deer	32	21	609	47 (116)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 5

Artemisia tridentata wyomingensis																	
A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20		1
Y	82	-	2	-	-	-	-	-	-	-	-	2	-	-	133		2
	88	14	3	-	-	-	-	-	-	-	17	-	-	-	1133		17
	95	11	11	5	1	-	-	-	-	-	28	-	-	-	560		28
	00	3	1	-	-	-	-	-	-	-	4	-	-	-	80		4
M	82	12	18	-	-	-	-	-	-	-	13	17	-	-	2000	17 23	30
	88	1	13	11	-	-	-	-	-	-	22	1	2	-	1666	20 21	25
	95	13	42	17	-	-	-	-	-	-	70	-	2	-	1440	16 25	72
	00	-	3	10	2	4	1	1	-	-	20	-	1	-	420	16 25	21
D	82	6	11	8	-	-	-	-	-	-	4	4	17	-	1666		25
	88	5	20	18	-	-	-	-	-	-	32	1	5	5	2866		43
	95	10	28	26	-	1	-	-	-	-	19	-	-	46	1300		65
	00	18	49	28	3	16	-	-	-	-	45	-	-	69	2280		114
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	1520		76
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	1140		57
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
		'82			54%			14%			+33%						
		'88			42%			34%			-42%						
		'95			50%			29%			-16%						
		'00			53%			28%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	3799	Dec:	44%		
												'88	5665		51%		
												'95	3300		39%		
												'00	2780		82%		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum microthecum																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	-	-	-	-	-	-	-	-	-	-	-	-	200		3	
	95	3	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	3	-	-	-	-	-	-	-	-	-	-	-	-	200	13 6	3	
	88	8	-	-	-	-	-	-	-	-	-	-	-	-	533	9 5	8	
	95	39	2	2	-	-	-	-	-	-	-	-	-	-	860	10 10	43	
	00	14	3	3	4	-	-	-	-	-	-	-	1	-	480	5 6	24	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	5	-	-	-	-	-	-	-	-	-	-	-	-	100		5	
	00	-	-	-	1	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+73%							
'88		00%			00%			00%			+28%							
'95		04%			04%			00%			-51%							
'00		12%			12%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	200	Dec:	0%			
												'88	733		0%			
												'95	1020		10%			
												'00	500		4%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4					
Gutierrezia sarothrae																			
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1	
	95	1327	-	-	1	-	-	-	-	-	1328	-	-	-	26560				1328
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0				
Y	82	12	-	-	-	-	-	-	-	-	12	-	-	-	800		12		
	88	46	-	-	-	-	-	-	-	-	46	-	-	-	3066			46	
	95	65	-	-	-	-	-	-	-	-	65	-	-	-	1300				65
	00	17	-	-	-	-	-	-	-	-	17	-	-	-	340				
M	82	100	-	-	-	-	-	-	-	-	100	-	-	-	6666	12	10		
	88	368	-	-	1	-	-	-	-	-	369	-	-	-	24600	8	6	369	
	95	108	5	-	-	-	-	-	-	-	113	-	-	-	2260	12	13	113	
	00	1386	-	-	-	-	-	-	-	-	1373	-	13	-	27720	8	9	1386	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	40	-	-	-	-	-	-	-	-	35	-	5	-	2666			40	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20				1
	00	103	-	-	-	-	-	-	-	-	65	-	-	38	2060				
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	100				5
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	320				
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'82		00%			00%			00%			+75%								
'88		00%			00%			01%			-88%								
'95		03%			00%			00%			+88%								
'00		00%			00%			03%											
Total Plants/Acre (excluding Dead & Seedlings)												'82	7466	Dec:	0%				
												'88	30332		9%				
												'95	3580		1%				
												'00	30120		7%				
Leptodactylon pungens																			
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0				0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20				
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-		
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	4	8	3	
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100	4	8	5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'82		00%			00%			00%											
'88		00%			00%			00%											
'95		00%			00%			00%			+50%								
'00		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-				
												'88	0		-				
												'95	60		-				
												'00	120		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	1	-	-	-	-	1	-	-	4	-	-	-	266			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	2	-	-	-	-	-	-	-	-	-	2	-	-	133	3	5	2
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333	4	8	5
	95	21	-	-	-	-	-	-	-	-	21	-	-	-	420	4	16	21
	00	16	-	-	-	-	-	-	-	-	16	-	-	-	320	4	12	16
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+78%							
'88		11%			00%			00%			-27%							
'95		00%			00%			00%			-14%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	133	Dec:	0%			
												'88	599		0%			
												'95	440		5%			
												'00	380		11%			